

The present patent application relates, as stated in its title, to a "DEVICE FOR OPENING THE BONNET OF A MOTOR VEHICLE" which novel manufacturing, conformation and design features fulfil the purpose to which it has been specifically conceived, with a maximum safety and effectiveness.

There exist in the market, and therefore they may be considered as state of the art, devices intended for locking and releasing a latching secured by any type of conventional means to the bonnet of the motor vehicle covering the motor opening. Said device has two purposes: on one hand it should prevent the bonnet from being opened up by any cause and being raised by the force of the air hiding the driver's front vision with a consequent risk; and, on the other hand, to prevent the motor from being opened up for stealing parts of the car inside the motor opening.

Typically, said latching is released by the action of a cable, one the end of which it is provided with a handle located inside the motor vehicle, whilst the opposed end is provided with a lever that retains the corresponding latching secured to the motor vehicle bonnet. This arrangement corresponds to a large amount of conventional devices acting in such a way that the user located inside the motor vehicle exerts a force on the handle and the cable on which it is secured by moving the lever and releasing said latching.

This type of devices has the disadvantage that they may be easily violated for stealing parts from the inside of the motor opening. It is enough to cut the cable that joins the handle to the latching and releasing the latching to open the motor vehicle bonnet.

The present invention seeks to overcome this disadvantage in such a way that any actions on the device result in the locking thereof through the means that are

herein explained.

The device of the invention essentially comprises a rear part or locking member provided with a bell associated with a rear portion (lock body) of the bonnet and in the vicinity of the motor vehicle front grid. Such locking member and the lock body are associated with each other by means of a sheath inside of which a driving cable is arranged.

Inside the locking member a cable terminal joining said locking member with the inner portion part of the lock body is provided. The sheath of the cable is flexible and it is inwardly overlapped to the locking member and the sheath terminal, said sheath being partially protected in the vicinity of the locking member by a flap and in the lock body by means of a dust-coat.

Inside the lock body there is provided a spear the rear portion of which is fitted into the bonnet lock, while the rear portion thereof is snap fitted to the shaft terminal and this, in turn, to a ring.

The device has been designed in such a way that unwanted manipulation thereof, either by rotation of the sheath or the bell thereof, results in releasing of the spear from the interior of the shaft terminal. Thus, the spear remains inside the lock and the device is released from the cable. Therefore, if a thief gains access to the inner part of the bonnet, there will be no possibilities to open up the bonnet from the interior when trying to manipulate the handle as the spear has been thus separated from the cable.

The features and the advantages of the device for opening the bonnet of a motor vehicle of the present invention will be apparent from the detailed description of a preferred embodiment thereof that will be given hereinafter by way of a non limiting example, with reference to the drawings herein enclosed, wherein:

Fig. 1 is a longitudinal cross-sectional view of an embodiment of the device of the invention;

Fig. 2 is a side elevational view of the shaft terminal cut lengthwise by plane AA' in Fig. 3;

5 Fig. 3 is a front elevational view of the shaft terminal;

Fig. 4 is a cross section of the ring;

Fig. 5 is a side elevational view of the ring;

10 Fig. 6 is a side elevational view of the sheath terminal;

Fig. 7 is a longitudinal cross sectional view of the sheath terminal;

Fig. 8 is a front elevational view of the sheath terminal;

15 Fig. 9 is a longitudinal cross sectional view of the cable terminal;

Fig. 10 is a front elevational view of the cable terminal;

20 Fig. 11 is a rear elevational view of the cable terminal;

Fig. 12 is a side elevational view of the dust-coat;

Fig. 13 is a longitudinal cross sectional view of the spear;

25 Fig. 14 is a longitudinal cross sectional view of the locking member;

Fig. 15 is a perspective view of the locking member bell;

30 Fig. 16 is a front elevational view of the sheath transversely cut by plane BB' in Fig. 17;

Fig. 17 is a side elevational view of the sheath;

Fig. 18 a side elevational view of the lock body;

and

35 Fig. 19 is a longitudinal cross sectional view of the lock body.

The various reference numerals which have been used herein to describe the preferred embodiment of the device of the present invention are given below:

- (10) device;
- 5       (11) cable;
- (12) sheath;
- (13) dust-coat;
- (14) lock body;
- (15) ring;
- 10       (16) sheath terminal;
- (17) spear;
- (18) cable terminal;
- (19) shaft terminal;
- (20) locking member;
- 15       (22) cylindrical body;
- (23) frusto conical body;
- (24) cylindrical body;
- (25) cylindrical body;
- (26) cylindrical hole;
- 20       (27) cover;
- (28) braided cables;
- (29) metal loop;
- (31) rear cylindrical neck of the dust-coat;
- (32) front cylindrical neck of the dust-coat;
- 25       (33) lock flap;
- (34, 35) spears;
- (37) body;
- (38) circular recess;
- (40) grooves;
- 30       (41) peaks;
- (42) valleys;
- (43) longitudinal recesses;
- (44) peaks;
- (45) valleys;
- 35       (46) cylindrical body;

(47) holes in the cable terminal;  
(48) circular extension;  
(49) cavity;  
(50) flap; and  
5 (51) circular recess.

In one of the preferred embodiments of the present invention and as shown in Fig. 1, the device (10) comprises a locking member (20) associated with the lock body (14) -see Figs. 18 and 19- through a sheath (12) and a  
10 driving cable (11) shown in Figs. 10 and 11.

Said locking member (20) -as seen in Fig. 14- comprises a cylindrical body (22) surrounding said sheath (12), extending into a body (23) having a frusto conical configuration which, in turn, extends into a further  
15 cylindrical body of a greater diameter than said cylindrical body (22) inside of which the shaft terminal (19) surrounding the cable (11) is provided. The shaft terminal (19) is provided with a slightly cylindrical body (24) extending into a further cylindrical body of smaller  
20 diameter (25) inside of which it is provided with a cylindrical dead hole (26) that surrounds and traps the cable (11) of the device (10).

The sheath (12) joins the locking member (20) to the lock body (14) by means of a cover (27) inside of which  
25 braided wires (28) are arranged. Said braided wires (28) are 0.30 mm approximately in diameter and a metal loop (29) is disposed therein serving the purpose of transmitting the torque without losing longitudinal flexibility.

The sheath (12) penetrates into the lock body (14) by the end opposed to that of the locking member (20) helped and protected by means of a dust-coat (13) which  
30 details may be seen in Fig. 12. Said dust-coat (13) is formed of bellows made of elastic material (rubber or the like) which rear cylindrical neck (31) surrounds the lock  
35 body (14) while the front neck (32) surrounds the sheath

(12) as shown in Fig. 1.

The lock body (14) is inserted through the flap in the rear portion of the motor opening and, in the front portion thereof, near the motor vehicle front venting grid. Inside said lock body (14) the main parts of the lock are provided, as shown in Fig. 20. The lock body (14) surrounds the sheath terminal (16), inside of which the shaft terminal (18) and the ring (15) wherein the spear (17) is fitted are provided.

Disassembly of the device (10) takes place by rotating the bell of the locking member (20) and releasing the spear (17) of the cable terminal (18). For this purpose, such spear (17) has an appropriate configuration which has been illustrated in Fig. 13. Said configuration consists of a cross-shaped body in cross-section from the ends of which respective spears (34) and (35) emerge which are allowed to be transversely moved as they are spaced apart from the body (37) by a circular recess (38) allowing said spears (34) and (35) to be transversely compressed or expanded, and never released from the lock but the cable terminal (18), according to the circumstances, when rotating the cable (11) and forcing the sheath terminal (16) to be rotated. Torque is transmitted by the sheath to said sheath terminal (16) which reacts backwards, dragging the ring (15) and the latter dragging the terminal (18). As the spear (17) is coupled to the lock, it remains within the lock and the spear (17) and the terminal (18) are thus disconnected.

As shown in detail in Figs. 9, 10 and 11, the terminal (18) of the cable (11) wraps and secures the cable (11) and it comprises a cylindrical body (46) provided with holes formed in the side surface thereof (47). Fastening of the terminal (18) in the lock body (14) is achieved by means of a circular extension (48) which, as it can be seen in Fig. 1, is fitted into a cavity (49) in the lock body

(14). At the opposed end of said terminal (18) a flap (50) is provided arranged spaced apart from said terminal (18) by a circular recess (51) allowing a certain degree of transverse flexibility of said flap (50) so that the cavity  
5 (49) accommodates the ring (15), as shown in Fig. 1.

As it can be seen, the sheath terminal (16) is provided with a side surface having grooves (40) defining picks (41) and valleys (42) therebetween corresponding to longitudinal recesses (43), said picks (41) and valleys  
10 (42) being fitted into further picks (44) and valleys (45) provided on the lock body (14), so that rotation on the sheath terminal (16) causes decoupling of the sheath (16) and the lock (14) at the same time the lock is released as the terminal (18) and the spear (17) are disconnected.

15 Once having been sufficiently described what the present invention consists in accordance to the enclosed drawings, it is understood that any detail modification can be introduced as appropriate, provided that variations may alter the essence of the invention as summarised in the  
20 appended claims.